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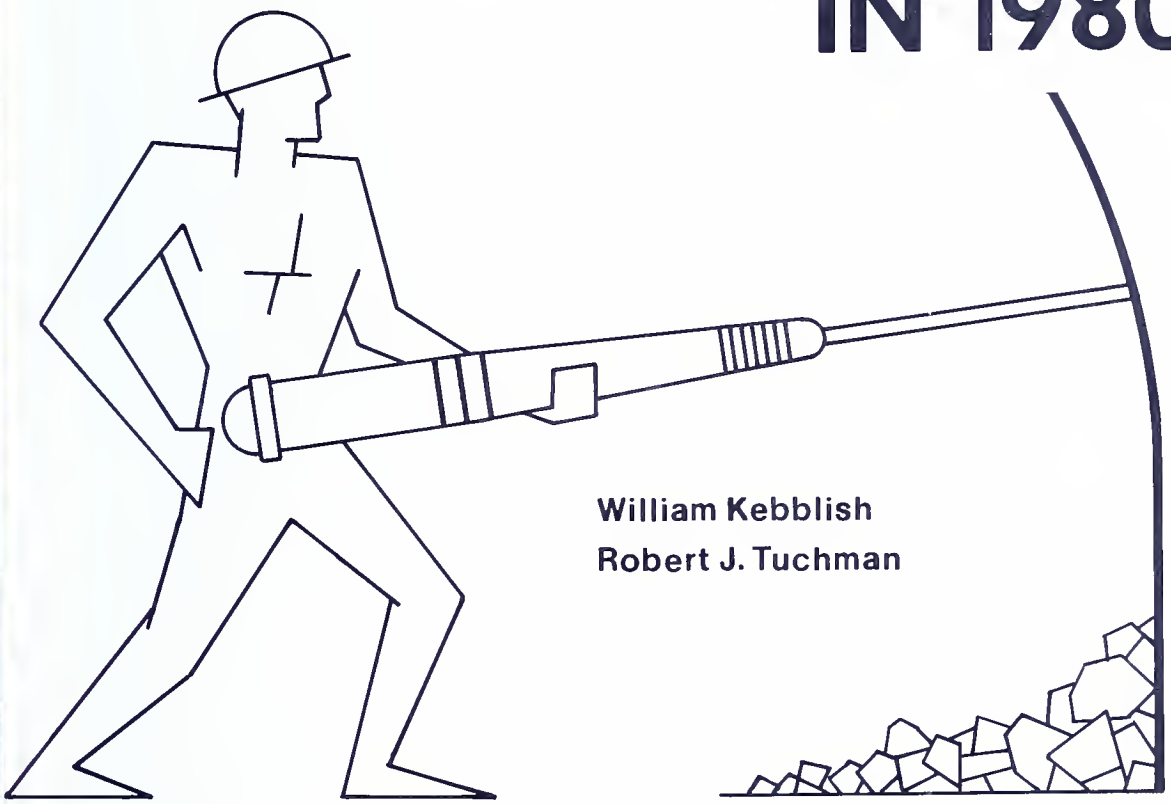
THE MINERAL INDUSTRY OF PENNSYLVANIA IN 1980



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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
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The Mineral Industry of Pennsylvania

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources, for collecting information on all nonfuel minerals.

By William Kebblish[1] and Robert J. Tuchman[2]

The value of Pennsylvania's nonfuel mineral production was $667.6 million in 1980, a 7% decrease from that of 1979. The decrease was related to economic conditions that curtailed construction activities. Compared with 1979 figures, production value increased for peat, ferroalloys, and zinc, but decreased for portland and masonry cement, clays, lime, sand and gravel, slag, stone, iron oxide pigments, and pig iron.

Nationally, Pennsylvania ranked high in mineral output and led in shipments of masonry cement and blast furnace slag production. The State was second in the production of pig iron, finished iron oxide pigments, and lime; third in stone, steel slag, and portland cement; and sixth in crude mica and zinc. Leading producing counties were York (cement and stone), Butler (lime, cement, and stone), Huntingdon (stone), and Armstrong (sand and gravel, clays, and stone).

Table 1.—Nonfuel mineral production in Pennsylvania[1]

Mineral		1979 Quantity	1979 Value (thousands)	1980 Quantity	1980 Value (thousands)
Cement:					
Masonry	thousand short tons	415	$24,177	324	$20,298
Portland	do.	6,508	259,756	5,570	237,684
Clays[2]	do.	2,468	20,099	1,650	12,112
Lime	do.	2,153	96,569	1,768	84,291
Mica (scrap)	do.	4	W	3	W
Peat	do.	24	531	26	552
Sand and gravel	do.	20,150	71,740	15,603	68,257
Stone:					
Crushed	do.	r71,432	r224,014	61,143	218,231
Dimension	do.	77	5,961	65	6,397
Zinc (recoverable content of ores, etc.)	metric tons	21,447	17,636	22,556	18,613
Combined value of clays (kaolin), tripoli, and values indicated by symbol W		XX	1,237	XX	1,171
Total		XX	r721,720	XX	667,606

rRevised. W Withheld to avoid disclosing company proprietary data; value included in "Combined value" figure. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Excludes kaolin; value included in "Combined value" figure.

Table 2.—Value of nonfuel mineral production in Pennsylvania, by county[1]

(Thousands)

County	1978	1979	Minerals produced in 1979 in order of value
Adams	W	W	Stone, lime, clays, mica.
Allegheny	W	W	Cement, clays, stone, sand and gravel.
Armstrong	$10,941	W	Sand and gravel, stone, clays.
Beaver	7,777	$12,419	Sand and gravel, clays.
Bedford	2,438	2,737	Stone, sand and gravel.
Berks	W	W	Cement, stone, clays, sand and gravel.
Blair	W	W	Stone, sand and gravel.
Bradford	W	W	Sand and gravel, stone.
Bucks	W	W	Stone, sand and gravel, clays.
Butler	32,651	37,553	Lime, cement, stone, sand and gravel, clays.
Cambria	W	W	Stone.
Cameron	W	W	Sand and gravel.
Carbon	W	W	Sand and gravel, stone.
Centre	W	35,491	Lime, stone.
Chester	W	W	Stone, lime, clays.
Clarion	W	W	Stone, sand and gravel.
Clearfield	W	W	Clays, stone, sand and gravel.
Clinton	W	W	Stone, clays.
Columbia	W	W	Sand and gravel, stone.
Crawford	1,210	917	Sand and gravel.
Cumberland	W	5,523	Stone, sand and gravel, clays.
Dauphin	W	W	Stone, sand and gravel.
Delaware	W	W	Stone.
Elk	W	W	Do.
Erie	4,616	4,643	Sand and gravel, peat.
Fayette	5,545	5,868	Stone, clays.
Forest	W	W	Sand and gravel, stone.
Franklin	W	W	Stone, sand and gravel.
Fulton	W	W	Do.
Huntingdon	W	W	Sand and gravel, stone.
Jefferson	W	W	Clays, stone.
Juniata	W	W	Stone.
Lackawanna	905	831	Stone, peat, sand and gravel.
Lancaster	W	W	Stone, clays, sand and gravel.
Lawrence	W	W	Cement, stone, sand and gravel, clays, peat.
Lebanon	W	W	Lime, stone.
Lehigh	W	W	Cement, zinc, stone.
Luzerne	W	W	Stone, sand and gravel, clays, peat.
Lycoming	W	W	Stone, sand and gravel.
McKean	W	W	Clays.
Mercer	W	W	Sand and gravel, stone.
Mifflin	W	987	Stone, sand and gravel, lime.
Monroe	W	W	Stone, sand and gravel, clays.
Montgomery	W	W	Stone, lime, cement, clays.
Montour	W	W	Stone.
Northampton	W	W	Cement, stone, sand and gravel.
Northumberland	W	W	Stone, sand and gravel, clays, tripoli.
Perry	W	W	Stone.
Philadelphia	--	W	Sand and gravel.
Pike	W	1,086	Sand and gravel, stone.
Potter	W	--	
Schuylkill	1,431	W	Stone, sand and gravel.
Snyder	W	W	Stone.
Somerset	3,684	4,431	Stone, clays, sand and gravel.
Susquehanna	W	W	Stone, sand and gravel.
Tioga	1,106	995	Do.
Union	W	W	Stone, clays.
Venango	1,120	889	Sand and gravel.
Warren	1,687	1,359	Do.
Wayne	W	936	Stone, sand and gravel.
Westmoreland	W	W	Do.
Wyoming	W	W	Sand and gravel.
York	52,480	59,119	Cement, stone, lime, sand and gravel, clays.
Undistributed	501,921	545,930	
Total[2]	629,516	721,720	

W Withheld to avoid disclosing company proprietary data; included with "Undistributed."

[1]Greene, Indiana, Sullivan, and Washington Counties are not listed because no nonfuel mineral production was reported.

[2]Data may not add to totals shown because of independent rounding.

Table 3.—Indicators of Pennsylvania business activity

		1979	1980[p]	Change, percent
Employment and labor force, annual average:				
Total civilian labor force	thousands	5,296.0	5,368.0	+1.4
Unemployment	do	368.0	417.0	+13.3
Employment (nonagricultural):				
Mining[1]	do	51.7	49.5	-4.3
Manufacturing	do	1,386.7	1,328.0	-4.2
Contract construction	do	204.2	190.3	-6.8
Transportation and public utilities	do	272.3	262.7	-3.5
Wholesale and retail trade	do	992.5	988.9	-.4
Finance, insurance, real estate	do	233.7	236.7	+1.3
Services	do	945.0	969.1	+2.6
Government	do	720.7	727.7	+1.0
Total nonagricultural employment[1]	do	4,806.8	[2]4,753.0	-1.1
Personal income:				
Total	millions	$100,385	$109,942	+9.5
Per capita		$8,558	$9,294	+8.6
Construction activity:				
Number of private and public residential units authorized		42,811	29,586	-30.9
Value of nonresidential construction	millions	$686.4	$882.5	+28.6
Value of State road contract awards	do	$105.5	$616.0	+483.9
Shipments of portland and masonry cement to and within the State	thousand short tons	3,067	2,630	-14.2
Nonfuel mineral production value:				
Total crude mineral value	millions	$721.7	$667.6	-7.6
Value per capita, resident population		$62	$56	-9.7
Value per square mile		$15,920	$14,727	-7.6

[p]Preliminary.
[1]Includes coal (anthracite and bituminous), gas, and oil extraction.
[2]Data do not add to total shown because of independent rounding.

Sources: U.S. Department of Commerce, U.S. Department of Labor, Highway and Heavy Construction Magazine, and U.S. Bureau of Mines.

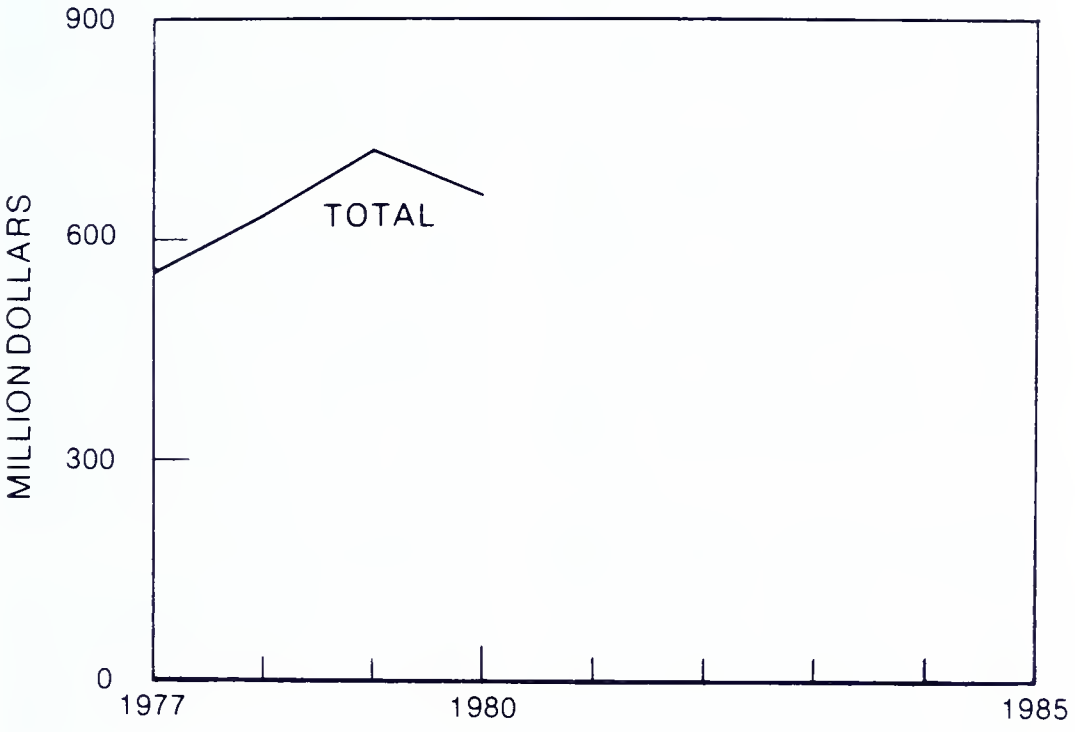

Figure 1.—Total value of nonfuel mineral production in Pennsylvania.

Trends and Developments.—Much of Pennsylvania's mineral output and manufactured mineral products are moved by rail. Clays, sand and gravel, slag, and iron and steel are among the raw materials and finished products relying on rail transportation. The State's capacity to export minerals was given a boost by a plan completed in late 1980 between the Commonwealth and Consolidated Rail Corp. (Conrail). The State agreed to finance $22.6 million of the project for modernizing the Greenwich Pier 124, Philadelphia. The handling capacity will increase from 3.5 million tons to 10.5 million tons by 1982.

A 1980 State Rail Plan was formulated by the Pennsylvania Department of Transportation (PennDot) to provide over $24 million to assist rail segments excluded from the Conrail system created in 1976. Also, 357 miles of light-density track would be added to the 55 miles of railroad already owned by the State. The State Rail Plan will aid mineral producers and manufacturers in transporting products to market. PennDot currently allocates $1 million annually for rail freight assistance programs.

On a local level, Carbon County officials arranged to purchase the Neshquehoning Branch line 109 from the Reading Co. and Conrail with assistance from the U.S. Department of Housing and Urban Development. The transaction would make the 17.8-mile railroad line, between Carbon and Schuylkill Counties, the first county-owned railroad in the State.

Industry annually moves approximately 64 million tons of bulk mineral materials and fabricated steel on the Ohio, Allegheny, and Monongahela Rivers in the Pittsburgh area. The U.S. Army Corps of Engineers, responsible for maintaining the Nation's waterways, scheduled repairs for the Emsworth locks located on the Ohio River below Pittsburgh. Repairs, for a 45-day period, are to begin in 1981, with work to be completed the following year. An adjacent, smaller lock will be used during construction.

Pennsylvania ranks third nationally in generation of industrial waste, including sulfuric acid, various metals, and sludge. A large portion of these waste products originates from mineral processing and metal manufacturing. To find markets for these wastes, a catalog was published by the Pennsylvania Chamber of Commerce featuring paid listings that detail available waste from companies identified by a code number. Potential buyers can contact the companies through the Chamber of Commerce's Pennsylvania Waste Information Exchange.

The Hillman Hall of Minerals and Gems, in Carnegie Museum of Natural History, Pittsburgh, opened in September. The new hall contains an outstanding array of 2,500 minerals and gems, including special sections featuring Pennsylvania specimens, rough and cut stones, microminerals, and luminescent and radioactive samples.

Pennsylvania State University continued work on a "Handbook for State and Local Taxation of Minerals." The booklet was designed to provide State legislators and other interested individuals with an analysis of the effects of mineral taxation on the mining industry.

Legislation and Government Programs.—On October 10, 1980, the Governor signed into law various measures affecting mineral mining operations, including a Clean Streams Law (Senate bill 992).

A Pennsylvania Commonwealth Court judge granted an injunction against the State Department of Environmental Resources (DER), preventing the agency from implementing new regulations covering surface mining in the State. The action was initiated by a group of mining companies because sections of the Federal Act pertaining to surface mining regulations were being challenged. DER's request to dismiss the court injunction was rejected by the Commonwealth Court.

During 1980, the General Assembly enacted three bills relating to the mineral industry:

(1) House bill 569 (medical technician treatment and liability),

(2) Senate bill 1262 (restoration of mined lands), and

(3) Senate bill 1263 (appropriation of monies for reclamation purposes).

The Pennsylvania Department of Agriculture proposed regulations for weighing and measuring devices used in the sale of precious metals. Interested persons were invited to provide written or oral comments on the proposed regulations.

Legislation signed by the Governor permitted the Pennsylvania Industrial Development Authority (PIDA) to lend money to businesses for nonmanufacturing purposes. PIDA can now direct money to small businesses and into high unemployment areas. New construction activity will require aggregates produced locally.

"A User's Guide to DER Permits" became available in early 1980. The publication provides information on permits required by mine operators prior to opening a mine in the State.

Of interest to the nonfuel mineral industries was the report prepared by the Committee on Surface Mining and Reclamation, as required by section 709 of the Surface Mining Control and Reclamation Act. This report covers current and developing reclamation technology for surface mines and assists in the establishment of effective and reasonable reclamation regulations. Public hearings were held on the study, and a final report is scheduled for completion in early 1981 for submission to the President and U.S. Congress.

The U.S. Army Corps of Engineers completed a Final Environmental Statement (FES) in mid-1980 on commercial sand and gravel dredging operations on the Allegheny River from Pittsburgh to Kittanning, a distance of 62.2 miles. The FES was required by section 102 of the National Environmental Policy Act of 1969. Under section 10 of the River and Harbor Act of 1899, as well as section 404 of the Clear Water Act, the Corps of Engineers issues permits to dredging companies extracting sand and gravel from navigable waters. In addition to obtaining these permits, dredging companies must comply with State and local regulations that affect and/or control use of land onshore.

The Pennsylvania Bureau of Topographic and Geologic Survey conducted a number of mineral-related projects during 1980, including geologic mapping in the areas of Altoona, Reading, Bloomsburg, Sunbury, and the Pocono Mountains. These data are to be incorporated into a revised State geologic map nearing completion. Work was also underway on a new tectonic map of the State. Other ongoing projects included investigation of landslides, sinkholes, and ground water problems, and collection of ground water data on the Susquehanna River Basin.

During 1980, the U.S. Bureau of Mines, in cooperation with the U.S. Geological Survey, conducted site-specific mineral surveys on national forest lands within Pennsylvania to develop information on mineral potential. These Roadless Area Review and Evaluation (RARE II) surveys will be used by the U.S. Congress in making wilderness classification decisions. RARE II areas investigated within Allegheny National Forest include the Allegheny Front (8,696 acres) and Hickory Creek (9,427 acres) planning areas in Warren County, and the Clarion River (4,042 acres) and Cornplanter (3,012 acres) planning areas in Elk County. Evaluation reports are scheduled for publication in early 1982.

REVIEW BY NONFUEL MINERAL COMMODITIES

NONMETALS

Cement.—In spite of decreased demand for cement in 1980, Pennsylvania ranked third nationally, behind Texas and California, in shipments and sales of portland cement, and first in shipments and sales of masonry cement. Shipments of portland cement declined 14% in quantity and over 8% in value, compared with those of 1979. Portland cement was shipped from 17 plants and/or terminals in 7 counties; counties leading in tonnage shipped were Northampton and Lawrence. Principal producers of portland cement included Coplay Cement Manufacturing Co. and Crane Co.

Masonry cement shipments decreased 22% in quantity and 16% in value, compared with 1979 levels. Shipments occurred from 15 plants and/or terminals in 7 counties; counties leading in quantity shipped were Northampton, Lawrence, and Lehigh. Principal producers of masonry cement were Coplay Cement Manufacturing Co., Crane Co., and National Gypsum Co.

The drop in shipments of both portland and masonry cement was due mainly to curtailed residential, industrial, and commercial construction during the year. This, in turn, was attributed to high interest rates and double-digit inflation.

In April 1980, Penn-Dixie Industries, Inc., filed for protection under Chapter 11 of the Federal Bankruptcy Act. During the year, the company's cement division operated one plant in Nazareth, Northampton County, and one in West Winfield, Butler County. The Nazareth plant was expected to be sold to Coplay Cement Manufacturing Co.; the West Winfield plant remained unsold.

During the year, United States Steel Corp.'s Universal Atlas Cement Div., including the Universal and Northampton

plants, was sold to Allentown-based Lehigh Portland Cement Co., a subsidiary of Portland Zementwerke, A.G., of Heidelberg, Federal Republic of Germany.

Late in the year, United States Cement Co. purchased Hercules Cement Co., a subsidiary of Gifford-Hill & Co., Inc. Hercules' cement plant is located in Stockertown, Northampton County, near the New Jersey border.

Officials of Penn Virginia Corp. announced plans to acquire The Whitehall Cement Manufacturing Co. in Whitehall, Lehigh County. Shareholders of Whitehall would receive 0.98 share of Penn Virginia common stock for each share of Whitehall.[3]

Medusa Corp. continued to improve and replace outmoded equipment. At Wampum, Lawrence County, $900,000 was funded for kiln improvements during 1980. Since April 1979, Medusa has operated as a subsidiary of Crane Co., a diversified manufacturer of building products and other industrial equipment.

Clays.—Production of clay and shale, excluding kaolin, totaled 1.6 million tons in 1980. Output and value decreased 33% and 40%, respectively, compared with those of 1979.

In 1980, 32 companies operated 66 clay and shale mines (10 fewer than in 1979) in 23 counties. Leading producing counties, in descending order of output, were Berks, York, Clearfield, and Jefferson.

The average unit value of clay and shale decreased to $7.34 per ton. Clay and shale was used mainly in the manufacture of face brick, firebrick, and common brick. Glen-Gery Corp., with 12 mines, was the leading clay and shale producer in Pennsylvania.

Narvon Products, Inc., with one mine in Lancaster County, was the State's only kaolin producer. Kaolin was used mainly in the manufacture of fertilizers and paint products.

Table 4.—Pennsylvania: Clays sold or used by producers, by use[1]

(Short tons)

Use	1979	1980
Common brick	335,527	128,081
Face brick	1,091,641	981,786
Firebrick, block and shapes	581,107	272,500
Flue linings	70,673	34,735
Lightweight aggregates	W	W
Mortar and cement, refractory	81,012	17,157
Portland and other cements	159,604	153,105
Tile: Drain, quarry, and structural	51,557	47,904
Other[2]	45,897	14,037
Exports: Mortar, cement, other refractories	50,860	286
Total	2,467,878	1,649,591

W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Excludes kaolin.
[2]Includes fertilizers, paint, pottery, roofing granules, sewer pipe, terra cotta, and data indicated by symbol W.

Graphite.—Synthetic graphite production in Pennsylvania increased approximately 50% in quantity and 100% in value from 1979 to 1980. Of the 17 producers of carbon and graphite products in the State, the three largest employers were Airco Speer Carbon Co., Keystone Carbon Co., and Stackpole Carbon Co., all in St. Marys, Elk County. Total number of employees at the three plants exceeded 6,000. Synthetic graphite was used in the manufacture of anodes, graphite shapes, crucibles and vessels, and electric-motor brushes.

Gypsum.—Production of calcined gypsum in Pennsylvania decreased 44% in quantity and 49% in value from 1979 to 1980. Raw gypsum mined by United States Gypsum Co. in Michigan and Nova Scotia was calcined at its Philadelphia facility; the operation employs about 150 workers. Two smaller companies producing gypsum products were H. B. Fuller Co., Bucks Co., and Insuldeck Corp., Northampton County. Calcined gypsum was used mainly in the manufacture of prefabricated products, such as regular wallboard, type-X wallboard, and lath. These products were used extensively in home and commercial construction.

Iodine.—Whitmoyer Laboratories, Inc., in Lebanon County, and West Agro-Chemical, Inc., in Washington County, imported crude iodine from other States. The iodine was used in the manufacture of pharmaceuticals, catalysts, and sanitation products.

Lime.—In 1980, Pennsylvania ranked second nationally behind Ohio in production

and sales of lime. The State produced over 1.7 million tons, or slightly more than 9% of the national total. Lime output decreased approximately 400,000 tons, compared with 1979 data, because of a 20% reduction in the State's pig iron production.

Lime was produced at 10 plants in 8 counties. Centre was the leading lime-producing county in the State, followed by Lebanon, Butler, Adams, Chester, York, Montgomery, and Mifflin Counties.

The average unit value of lime was $47.67 per ton, an increase of $2.82 over that of 1979. The steel industry was the largest consumer of lime, and lesser amounts were used for sewage treatment, water purification, abatement of acid mine water discharges, paper and pulp products, and soil stabilization.

Table 5.—Pennsylvania: Lime sold or used by producers, by use

Use	1979		1980	
	Quantity (short tons)	Value (thousands)	Quantity (short tons)	Value (thousands)
Steel, BOF	900,987	$40,411	698,721	$32,060
Steel, electric	285,871	12,822	237,732	11,348
Sewage treatment	193,587	8,683	181,721	8,950
Water purification	185,710	8,329	140,805	6,979
Steel, open-hearth	80,976	3,632	124,761	6,297
Mason's lime	83,306	3,736	74,896	3,773
Acid mine water	69,606	3,122	57,782	2,853
Agriculture	23,154	1,038	34,007	1,386
Paper and pulp	20,504	920	15,607	753
Tanning	10,169	456	14,238	714
Other[1]	299,191	13,420	188,130	9,178
Total	2,153,061	96,569	1,768,400	84,291

[1]Includes alkalies, explosives, glass, oil well drilling, ore concentration, other chemical and industrial uses, other construction uses, other metallurgical uses, paint, petrochemicals, petroleum refining, refractory dolomite, rubber (1979), sand-lime brick, silica brick, soil stabilization, sugar refining, sulfur removal, and wire drawing.

Mica.—Only one company in Pennsylvania mined crude mica in 1980. Gross Minerals Corp., near Aspers, Adams County, produced scrap and flake mica by beneficiation of pegmatites. The product was used in mica paper and other electrical insulating materials.

Mullite.—The production and production values of synthetic mullite in 1980 decreased slightly, compared with those of 1979. A. P. Green Refractories, Philadelphia County, produced synthetic mullite by high-temperature processing of aluminum silicate materials. Mullite is a heat-resistant material used in furnace linings and refractories.

Peat.—In 1980, peat production in Pennsylvania increased 8% in quantity and 4% in value, compared with 1979 levels. Of the State's eight peat producers, six were situated in a three-county area in northeastern Pennsylvania: Three in Luzerne County, two in Lackawanna County, and one in Monroe County. The other two producers were located in Erie and Lawrence Counties. Approximately 76% of the peat produced was humus, and the remaining 24%, reed sedge. Uses were for agricultural and horticultural purposes.

Perlite.—Crude perlite was shipped into six counties in Pennsylvania and expanded at six plants by five companies. The total amount of expanded perlite sold or used in 1980 was nearly 39,000 tons valued in excess of $5 million, reflecting a 14% increase in production and a 33% increase in value, compared with those of 1979. Plants in western Pennsylvania were the Therm-O-Rock Div. of Allied Block Chemicals Co., located at New Eagle, Washington County, which began operating in 1978; and Perlite Manufacturing Co., located at Carnegie, Allegheny County. Producers in eastern Pennsylvania included Armstrong World Industries, United States Gypsum Co., and Pennsylvania Perlite Corp. Perlite was used in plaster and cement aggregates and for horticultural purposes. Other uses included low-temperature and cavity-fill insulation, ceiling tile, and various industrial applications.

Pyrophyllite.—Pyrophyllite, a natural hydrous aluminum silicate found in metamorphic rocks, was processed in Montgomery County for use in ceramics.

Sand and Gravel.—In 1980, sand and gravel was produced by 114 companies (11 fewer than in 1979) in 41 of the State's 67 counties. Production of sand and gravel in Pennsylvania dropped 23% from 1979 to 1980 because of inflation and high interest

rates, which curtailed residential, industrial, and commercial construction.

Most of the sand and gravel deposits in Pennsylvania were relatively small, supplying local construction needs. Of the 132 sand and gravel operations throughout the State in 1980, 115 produced less than 200,000 tons each, accounting for 45% of the State's total production.

Leading counties in output of construction sand and gravel, in descending order, were Bucks, Armstrong, and Erie, accounting for 43% of the State's production total. Construction sand and gravel was used mainly for concrete aggregate, asphaltic concrete, and roadbase.

Industrial sand was produced in Allegheny, Huntingdon, and York Counties. Major uses were in glass manufacture, ferrous foundry operations, and chemical and metallurgical processes.

Nearly 92% of all sand and gravel produced was shipped to market by truck, indicating nearby local markets. Other modes of transportation included railroad and waterway.

Table 6.—Pennsylvania: Construction sand and gravel sold or used, by major use category

Use	1979			1980		
	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton
Concrete aggregate	7,718	$26,405	$3.44	5,785	$23,433	$4.05
Plaster and gunite sands	552	1,851	3.35	423	1,479	3.49
Concrete products	1,317	5,174	3.93	696	3,042	4.37
Asphaltic concrete	2,336	7,047	3.02	2,873	13,177	4.59
Road base and coverings	4,728	14,233	3.01	2,932	9,595	3.27
Fill	1,483	2,529	1.71	1,059	2,508	2.37
Snow and ice control	245	802	3.27	158	586	3.70
Railroad ballast	45	126	2.76	W	W	2.76
Other	622	1,864	3.00	628	2,063	3.28
Total[1] or average	19,047	60,031	3.15	14,554	55,883	3.84

W Withheld to avoid disclosing company proprietary data; included in "Other."
[1]Data may not add to totals shown because of independent rounding.

Table 7.—Pennsylvania: Sand and gravel sold or used by producers, by use

Use	1979			1980		
	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton
Construction:						
Sand	9,787	$30,312	$3.10	8,293	$31,559	$3.81
Gravel	9,261	29,718	3.21	6,261	24,324	3.88
Total[1] or average	19,047	60,031	3.15	14,554	55,883	3.84
Industrial sand	1,102	11,709	10.62	1,049	12,374	11.79
Grand total[1] or average	20,150	71,740	3.57	15,603	68,257	4.37

[1]Data may not add to totals shown because of independent rounding.

Table 8.—Pennsylvania: Sand and gravel sold or used by producers, by county

County	1979[1]			1980		
	Quantity (thousand short tons)	Value (thousands)	Number of companies	Quantity (thousand short tons)	Value (thousands)	Number of companies
Allegheny	W	W	1	W	W	1
Armstrong	2,308	$8,820	3	W	W	2
Beaver	2,435	11,097	4	821	$4,146	4
Bedford	3	7	1	--	--	--
Berks	53	79	1	--	--	--
Blair	W	W	1	W	W	1

See footnotes at end of table.

Table 8.—Pennsylvania: Sand and gravel sold or used by producers, by county —Continued

County	1979[1]			1980		
	Quantity (thousand short tons)	Value (thousands)	Number of companies	Quantity (thousand short tons)	Value (thousands)	Number of companies
Bradford	373	$1,017	6	291	$889	6
Bucks	2,955	7,443	3	2,588	7,595	4
Butler	293	W	2	W	W	2
Cameron	W	W	1	W	W	1
Carbon	408	1,374	3	324	1,365	3
Clarion	W	W	1	W	W	1
Clearfield	W	W	1	W	W	1
Columbia	W	W	2	W	W	2
Crawford	335	917	8	224	667	8
Cumberland	W	470	2	265	1,064	3
Dauphin	W	W	1	W	W	1
Erie	1,907	4,584	15	1,641	4,440	14
Forest	W	W	2	W	W	1
Franklin	W	W	1	W	W	1
Fulton	W	W	1	W	W	1
Huntingdon	W	W	1	W	W	1
Lackawanna	W	W	2	W	W	1
Lancaster	98	371	1	--	--	--
Lawrence	622	2,118	9	499	1,877	8
Luzerne	949	2,578	8	683	2,442	8
Lycoming	W	W	1	W	W	1
Mercer	662	1,572	6	279	916	5
Mifflin	W	W	1	W	W	1
Monroe	223	509	4	292	861	3
Northampton	W	W	2	530	1,868	3
Northumberland	248	871	1	202	786	1
Philadelphia	W	W	1	W	W	1
Pike	248	639	4	144	545	3
Schuylkill	W	W	1	W	W	1
Somerset	12	41	1	10	39	1
Susquehanna	W	W	1	W	W	1
Tioga	182	199	3	146	417	3
Venango	436	889	5	368	1,035	4
Warren	481	1,359	10	509	1,733	9
Wayne	137	338	3	W	W	2
Westmoreland	W	W	1	W	W	1
Wyoming	W	W	2	W	W	2
York	W	W	2	W	W	2
Undistributed	3,679	12,739	--	5,787	35,572	--
Total	19,047	60,031	130	15,603	68,257	119

W Withheld to avoid disclosing individual company proprietary data; included in "Undistributed."
[1]Does not include industrial sand and gravel.

Slag-Iron and Steel.—Pennsylvania led the Nation in 1980 in the production of iron and steel slag. Total slag produced amounted to 5.7 million tons valued at $23.9 million, a decline of 22% in output and 13% in value, compared with those of 1979. The decrease in slag output reflected a drop in the State's pig iron production. Of the total slag produced, 86% was iron slag, and 14%, steel slag.

Types of iron slag produced included air-cooled, expanded, and granulated. Major uses of air-cooled slag were for asphalt and concrete aggregate and as a roadbase material; expanded slag was used in concrete products; and granulated slag was used for roadbase material, fill, and cement manufacture. Steel slag was used mainly for roadbase material. Principal slag producers included Bethlehem Mines Corp. and Warner Co.

Millcraft Industries, Inc., in Washington, Pa., announced a new licensing agreement with a West German firm permitting it to engineer, manufacture, and erect a proprietary system for the granulation of blast furnace slag.

Stone.—In 1980, Pennsylvania ranked second to Texas in the value of stone produced and third, behind Texas and Florida, in quantity. The State's 221 quarries were located in 51 of the State's 67 counties; Bucks County led with 16 such operations.

Of the 61.1 million tons of crushed stone produced during the year, limestone accounted for 78%; sandstone, 6%; traprock, 6%; and other types, 10%. Leading counties in output of crushed stone were Bucks, Lancaster, Northampton, and York, each producing over 4 million tons in 1980. Principal producers included New Enterprise Stone & Lime Co., Inc., and Warner Co.

Dimension stone was quarried at 18 operations in 9 counties. Bucks and Northampton Counties, with a total of six quarries, accounted for 56% of the State production total. Principal types of dimension stone produced were sandstone and slate.

Table 9.—Pennsylvania: Dimension stone[1] sold or used by producers, by use

Use	1979			1980		
	Short tons	Cubic feet (thousands)	Value (thousands)	Short tons	Cubic feet (thousands)	Value (thousands)
Rough stone:						
Rough blocks	--	--	--	113	1	$16
Irregular-shaped stone	21,199	271	$535	5,805	74	179
Rubble	1,831	23	23	10,726	137	122
Monumental	W	W	W	4,007	40	581
Flagging	1,785	23	66	1,478	19	55
Dressed stone:						
Cut	16,946	13	690	17,815	228	793
Sawed	--	--	--	W	W	10
House stone veneer	--	--	--	W	W	1
Flagging	9,098	104	553	5,722	63	506
Roofing slate (standard)	2,789	31	721	2,761	30	1,267
Structural and sanitary	4,653	51	2,053	4,286	47	1,904
Blackboards	146	2	58	W	W	W
Flooring slate	641	7	133	W	W	W
Other[2]	17,558	189	1,128	12,686	140	963
Total[3]	76,646	714	5,961	65,399	780	6,397

W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Includes granite, sandstone, slate, and other stone.
[2]Includes stone used in dressed construction, billiard table tops, and unspecified uses.
[3]Data may not add to totals shown because of independent rounding.

Table 10.—Pennsylvania: Crushed stone[1] sold or used by producers, by use

(Thousand short tons and thousand dollars)

Use	1979		1980	
	Quantity	Value	Quantity	Value
Agricultural limestone	1,728	10,028	1,992	12,712
Agricultural marl and other soil conditioners	110	763	--	--
Poultry grit and mineral food	W	W	66	654
Concrete aggregate	5,409	17,232	4,916	18,002
Bituminous aggregate	6,057	19,520	5,588	20,334
Macadam aggregate	1,692	4,991	1,354	4,434
Dense-graded roadbase stone	13,737	40,445	11,899	39,802
Surface treatment aggregate	2,878	9,003	2,144	7,787
Other construction aggregate and roadstone	17,732	50,981	14,659	46,025
Riprap and jetty stone	922	3,005	667	2,667
Railroad ballast	1,589	5,097	1,532	5,614
Filter stone	545	2,065	488	2,059
Manufactured fine aggregate (stone sand)	1,561	5,752	1,533	6,620
Terrazzo and exposed aggregate	231	956	263	1,230
Cement manufacture	r9,187	r19,661	7,378	17,250
Lime manufacture	3,259	10,854	2,768	10,470
Dead-burned dolomite	438	1,972	W	W
Flux stone	2,955	12,199	2,307	10,846
Refractory stone	72	1,262	82	1,644
Mine dusting	131	1,683	154	2,030
Asphalt filler	108	636	101	759
Other fillers or extenders	147	2,073	107	1,969
Building products	124	334	90	262
Fill	W	W	2	6
Glass manufacture	W	W	W	681
Roofing granules	W	W	191	310
Other[2]	819	3,503	862	4,066
Total[3]	r71,432	r224,014	61,143	218,231

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Includes limestone, granite, sandstone, traprock, and other stone.
[2]Includes whiting or whiting substitute, abrasives, chemical stone for alkali work, and unspecified uses.
[3]Data may not add to totals shown because of independent rounding.

Sulfur.—Three petroleum refineries in Philadelphia and Delaware Counties and one steel mill near Pittsburgh recovered elemental sulfur in 1980. Production amounted to approximately 57,000 metric tons valued at more than $3.4 million, reflecting a slight drop in output and a slight increase in value, compared with those of 1979.

Elemental sulfur was recovered from refinery gases; a lesser amount was recovered in the treatment of natural gas. Principal

uses were in the manufacture of sulfuric acid for fertilizers, in the leaching of ores, and in chemicals, fibers, paints, and explosives.

Tripoli.—Keystone Filler & Manufacturing Co.'s Sheddy Mine in Northumberland County produced tripoli, which was used as an abrasive and filler.

Vermiculite.—Crude vermiculite shipped into Pennsylvania was exfoliated by J. P. Austin, Inc., Allegheny County, and W. R. Grace & Co., Lawrence County. Although the quantity exfoliated in 1980 was slightly less than that of 1979, value increased more than 6%. Major uses were for lightweight concrete aggregate, loose fill insulation, horticultural purposes, and soil conditioning.

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Abrasives, Manufactured.—Manufactured abrasives, consisting of steel shot and grit, were produced by Durasteel Abrasive Co., in Westmoreland County; and Carborundum Co. and Ervin Industries, Inc., both in Butler County. Silicon carbide, another manufactured abrasive, was produced by Satellite Alloy Corp., near Pittsburgh. The finished products were used as abrasives and in refractories.

Cadmium.—The primary producer of cadmium in 1980 was New Jersey Zinc Co. in Lehigh County. Cadmium, a byproduct of zinc smelting, was used for electroplating, plastic stabilizers, and pigments.

Ferroalloys.—In 1980, ferroalloys shipments in Pennsylvania totaled 6,823 tons valued at $92.6 million, reflecting a 21% decrease in quantity but a 24% increase in value, compared with those of 1979. Six ferroalloys plants were located in the State: AMAX Inc., Washington County; Molycorp, Inc., a subsidiary of Union Oil Co. of California, Washington County; Penn Rare Metals Div., a subsidiary of Cabot Corp., Bucks County; Pesses Co., Lawrence County; Reactive Metals & Alloys Corp., Lawrence County; and Reading Alloys, Inc., Berks County.

An expansion project began at Molycorp., Inc.'s, molysulfide roasting facilities in Washington, Pa., designed to add 20 million pounds of contained molybdenum annually to the plant's current 6-million-pound-per-year capacity. Molysulfide concentrates are to be shipped from the company's complex in New Mexico to the Washington plant for alloy processing. Completion is expected by December 1981.

Iron Oxide Pigments.—Pennsylvania led the Nation in value of finished iron oxide pigments, excluding regenerator oxides, in 1980. Shipments totaled 32,273 tons valued at over $26 million, reflecting a slight decrease in tonnage but a 9.1% increase in value, compared with those of 1979. Finished iron oxide pigments were shipped from eastern Pennsylvania; regenerator oxides, by one company in Allegheny County. Iron oxide pigments were used in paints, rubber products, plastics, concrete products, paper, magnetic ink, and fertilizers.

Iron and Steel.—In 1980, Pennsylvania ranked second nationally, behind Indiana, in pig iron shipments and value. Shipments amounted to over 15 million tons valued at nearly $3 billion, representing a decrease of 20% in quantity and 18% in value, compared with 1979 figures. Basic pig iron accounted for 93% of total production. Other types of pig iron produced were bessemer, malleable, and direct castings.

Numerous layoffs occurred in the steel industry in Pennsylvania during the first half of 1980. The cutbacks were attributed to depressed orders, slumping auto demand, and heavy imports of both steel and automobiles. United States Steel Corp., the Nation's largest steelmaker, had the largest number of employees laid off, mainly in Allegheny and Beaver Counties. This included the temporary shutdown of its Edgar Thomson Works in Braddock in early June, furloughing 2,000 people. Allegheny Ludlum Steel Corp. laid off 900 of 4,700 workers at three Pittsburgh area plants, and Jones & Laughlin Steel Corp. experienced reductions at its Pittsburgh and Aliquippa Works. The overall slump in the steel industry, however, began to turn about by fall, and United States Steel recalled 800 workers in September at its Edgar Thomson Works.

United States Steel reviewed plans to replace 11 open hearth furnaces at its Homestead plant with basic oxygen equipment or other advanced steelmaking technology. The company also began building a 1.3-million-ton-per-year continuous slab caster at Edgar Thomson Works.

Bethlehem Steel Corp. planned to build six new soaking pit furnaces at Bethlehem, costing $9 million; install a new electric furnace melt shop at Johnstown; and improve its rail-producing facilities at Steelton.

Sharon Steel Corp. began a $60 million expansion and modernization program at Farrell, Mercer County. The program in-

volves the installation of a fourth 150-ton basic oxygen furnace, enlargement of one of two 125-ton electric arc steelmaking furnaces, additional pollution controls at the melt shop, and six new soaking pits. Approximately 2,000 additional jobs are to be provided by 1983, when modernization is completed.

National Supply Co., a subsidiary of Armco, Inc., planned a $42 million plant expansion in Ambridge, Beaver County, to include installation of a stretch mill and supporting finishing facilities. Plant production of tubular goods is expected to increase by 25%.

Condec Corp., former owner of the Fort Pitt Steel Casting division in McKeesport, Allegheny County, sold the plant on May 1, 1980, to its employees. The foundry, which produced valve castings for the petrochemical industry, is now known as McKeesport Steel Castings Co.

Zinc.—Pennsylvania ranked fifth nationally in zinc production in 1980, producing 22,556 metric tons, or 7% of the national production total. Both quantity and value increased slightly over those of 1979. The unit price of zinc remained at 37 cents per pound. Lehigh County, in eastern Pennsylvania, was the only county in which zinc was produced.

In late 1980, St. Joe Minerals Corp. reopened its smelter in Monaca, Beaver County, as a result of a new zinc deposit discovered near Pierrepont, N.Y. The company plans to transport zinc concentrates from New York to the smelter for processing. Production at the Monaca plant is anticipated at about 50,000 tons of slab zinc and zinc oxide by 1981.

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[1]State mineral specialist, Bureau of Mines, Pittsburgh, Pa.
[2]Program assistant, Bureau of Mines, Pittsburgh, Pa.
[3]Penn Virginia Corp. Annual Report, 1980, p. 34.

Table 11.—Principal producers

Commodity and company	Address	Type of activity	County
Abrasives:			
Satellite Alloy Corp	Satellite Industrial Park Box 171 Springdale, PA 15144	Plant	Allegheny.
Cement:			
Coplay Cement Manufacturing Co.[1]	Nazareth, PA 18064	do	Lehigh and Northampton.
Crane Co	300 Park Ave. New York, NY 10022	do	Lawrence and York.
Keystone Portland Cement Co.[1]	Box 1785 Allentown, PA 18105	do	Northampton.
Louisville Cement Co	501 South 2d St. Louisville, KY 40202	do	Lawrence.
Penn-Dixie Industries, Inc.[1 2]	60 East 42d St. New York, NY 10017	do	Butler and Northampton.
Clays:			
Dresser Industries, Inc	Box 6504 Houston, TX 77005	Pit	Clearfield and Somerset.
Glen-Gery Corp	227 North 5th St. Reading, PA 19601	Pit	Adams, Berks, Northumberland, Union, York.
Hanley Co	28 Kennedy St. Bradford, PA 16701	Pit	Jefferson and McKean.
Resco Products, Inc	Box 108 Norristown, PA 19404	Pit	Clearfield and Huntingdon.
Graphite, synthetic:			
Airco Speer Carbon	800 Theresia St. St. Marys, PA 15857	Plant	Elk.
Charles Pfizer & Co., Inc	235 East 42d St. New York, NY 10017	do	Northampton.
Stackpole Carbon Co	St. Marys, PA 15857	do	Elk.
Gypsum, calcined:			
United States Gypsum Co.[3]	101 South Wacker Dr. Chicago, IL 60606	do	Philadelphia.
Iron oxide pigments:			
Prince Manufacturing Co	700 Lehigh St. Bowmanstown, PA 18030	do	Carbon.
Reichard-Coulston, Inc	15 East 26th St. New York, NY 10010	do	Northampton.
Lime:			
J. E. Baker Co.[1]	Box 1189 York, PA 17405	do	York.
Mercer Lime & Stone Co	1640 Oliver Bldg. Pittsburgh, PA 15222	do	Butler.

See footnotes at end of table.

Table 11.—Principal producers —Continued

Commodity and company	Address	Type of activity	County
Peat:			
Lake Benton Peat Moss	622 South Blakely St. Dunmore, PA 18510	Bog	Lackawanna.
Perlite, expanded:			
Armstrong Cork Co	Lancaster, PA 17603	Plant	Lancaster.
Pennsylvania Perlite Corp	Box 2002 Lehigh Valley, PA 18001	do	Lehigh and York.
Perlite Manufacturing Co	Box 478 Carnegie, PA 15106	do	Allegheny.
Sand and gravel:			
Davison Sand & Gravel Co	3d Ave. and 4th St. New Kensington, PA 15068	Dredge	Westmoreland.
Dravo Corp	One Oliver Plaza Pittsburgh, PA 15222	do	Beaver.
Erie Sand Steamship Co	Box 153 Erie, PA 16512	do	Erie.
Shippingport Sand & Gravel Co	1200 Stambaugh Bldg. Youngstown, OH 44503	Pit	Armstrong.
Warner Co.[1 4 5]	1721 Arch St. Philadelphia, PA 19103	Pit	Bucks.
Slag:			
Bethlehem Mines Corp.[1 4]	701 East 3d St. Bethlehem, PA 18016	Plant	Cambria.
Dunbar Slag Co	Box 666 Sharon, PA 16146	do	Mercer.
Standard Slag Co	1200 Stambaugh Bldg. Youngstown, OH 44503	do	Cambria.
Stone:			
G. & W. H. Corson, Inc.[4]	Plymouth Meeting, PA 19462	Quarry	Montgomery.
General Crushed Stone Co	712 Drake Bldg. Easton, PA 18042	do	Bucks, Chester, Delaware, Lancaster, Luzerne, Perry.
Glasgow Quarry, Inc	Box 248 Glenside, PA 19038	do	Montgomery.
Martin Marietta Corp	Box 30013 Raleigh, NC 27612	do	Centre, Chester, Fayette, Northampton.
New Enterprise Stone & Lime Co., Inc	New Enterprise, PA 16664	do	Bedford, Blair, Cumberland, Franklin, Huntingdon, Somerset.
Sulfur:			
Atlantic Richfield Co	3144 Passyunk Ave. Philadelphia, PA 19145	Plant	Philadelphia.
British Petroleum Corp., Ltd	Box 428 Marcus Hook, PA 19061	do	Delaware.
Gulf Oil Corp	Box 7408 Philadelphia, PA 19101	do	Philadelphia.
Tripoli:			
Keystone Filler & Manufacturing Co	Muncy, PA 17756	Pit	Lycoming.
Vermiculite, exfoliated:			
J. P. Austin Associates, Inc	300 Mt. Lebanon Blvd. Pittsburgh, PA 15234	Plant	Allegheny.
W. R. Grace & Co	62 Whittemore Ave. Cambridge, MA 02140	do	Lawrence.

[1]Also stone.
[2]Also clays.
[3]Also expanded perlite.
[4]Also lime.
[5]Also slag.